

## WHAT IS CLAIMED IS:

1. A combination lock, comprising
  - an outer housing part having a knob mechanism, a clear button,
  - 5 and a plurality of numbered buttons fitted thereto; the knob mechanism being provided for pushing a push plate as well as for retreating a dead bolt to a disengaged position so that a door with the lock is unlocked;
  - each numbered button having an upper piston, a first springs, a rotary shaft, a first torsion spring, a fixing plate, a ringed lock plate, a rotary
  - 10 base arranged under a cap thereof; the numbered buttons having a lock plate cover arranged under them; the fixing plate, first torsion spring, rotary shaft, and upper piston associated with each numbed button being joined together by means of a screw; two ends of each first torsion spring being respectively fixedly connected to corresponding rotary shaft, and
  - 15 fixing plate; each ringed lock plate having a flat portion on an outer side; the rotary bases being positioned in, and capable of moving together with, respective ringed lock plates; each rotary base having a plurality of spaced guide trenches on an inner side thereof for allowing protrusions formed on an outer side of rotary shaft of a corresponding numbered
  - 20 button to be fitted onto when the numbered button is pressed; the spaced guide trenches of the rotary bases being formed such that the rotary bases will rotate to make the ringed lock plates rotate together when the protrusions formed on the rotary shafts are moved along them; the clear

button having a lower push post arranged under a cap thereof; upper and lower end portions of the lower push post being respectively passed through a second upper spring, and a second lower spring; the lower push post having a slope between the upper and the lower end portions thereof;

an inner base having holding rooms, which oppose corresponding numbered buttons for holding corresponding ringed lock plates and rotary bases therein; hollows being formed on an upper side of the inner base so that parts of the ringed lock plates are allowed to show;

a push plate having an elongated middle hole, curved recess portions spaced along an inner side and next to the elongated middle hole, and downwards extending pushing plates at a first left end; the push plate being connected to third springs at a second right end so as to be biased towards the first end with the third springs;

a main recover base having a plurality of elongated holes formed along it; rotary control elements being arranged above corresponding elongated holes of the main recover base; rotary locating shafts being arranged under corresponding elongated holes; the rotary control elements being joined to, and movable together with, corresponding rotary locating shafts; the main recover base having a slope opposing the slope of the lower push post of the clear button; the rotary control elements being engaged with the rotary bases at upper ends so that each rotary control element, corresponding ringed lock plate, rotary base, and

rotary locating shaft can move together with each other; each rotary locating shaft having a plurality of engaging trenches on an annular outer side; fourth springs being connected to a second right end of the main recover base; equidistantly spaced push protrusions being formed along a lower side of the main recover base; a recover base being disposed under the main recover base, and having sloping trenches opposing the push protrusions; the recover base having spring-biased locating pins, which can engage the engaging trenches of corresponding rotary locating shafts; each rotary control element having a fourth torsion spring fitted to a lower end; two ends of each fourth torsion spring being respectively engaged with a corresponding stopping protrusion of the inner base, and a stopping protrusion of a corresponding rotary control element;

a bottom base having a plurality of through holes facing corresponding rotary locating shafts, and a limiting stop post at an edge of each of the through holes thereof; each rotary locating shaft having a fifth torsion spring fitted to a lower end; two ends of each fifth torsion spring being respectively engaged with a corresponding limiting stop post of the bottom base, and a stopping protrusion of a corresponding rotary locating shaft;

a bottom cover having a plurality of round holes facing corresponding rotary locating shafts, and a spring base fitted to an upper side thereof; the spring base being biased up by means of sixth springs; sixth screws being passed through the spring base, and connected to the

rotary locating shafts for connecting the rotary locating shafts to the spring base; and

an inward housing part having a knob fitted thereto, which is used for setting a unlocking combination of the lock; the setting knob is  
5 connected so as to be capable of moving together with one of the sixth screws for making the spring base and the rotary locating shafts move downwards by means of rotation thereof;

whereby all of numbered buttons in the unlocking combination have to be pressed respective correct numbers of times for successfully  
10 unlocking the lock.

2. The combination lock as claimed in claimed 1, wherein each upper piston of numbered button has a curved bar on a bottom thereof while each rotary shaft has a curved protrusion on an upper end, and a recess opposing the curved protrusion; each upper piston being fitted to one  
15 of the rotary shafts with the curved bar being received in the recess so that rotation of the rotary shaft is limited within an angle by means of the curved bar; each rotary shaft having an engaging trench therein; each fixing plate having a gap; two ends of each first torsion spring being respectively engaged with a corresponding engaging trench, and  
20 a corresponding gap of fixing plate so as to secure the first torsion spring in position.

3. The combination lock as claimed in claimed 1, wherein the lock plate cover has through holes facing corresponding numbered buttons, and

gaps adjacent to each through hole thereof for allowing the protrusions formed on the outward sides of the rotary shafts to be fitted in.

4. The combination lock as claimed in claimed 1, wherein each ringed lock plate has a plurality of trenches on an inner side while each rotary  
5 base has bumps on an outer side; the bumps being fitted in the trenches of the ringed lock plates so that each rotary base can turn together with a corresponding ringed lock plate.
5. The combination lock as claimed in claimed 1, wherein each of the spaced guide trenches of each rotary base consists of a sloping upper  
10 section, and a vertical lower section.
6. The combination lock as claimed in claimed 1, wherein the inner base is formed with a plurality of holding rooms thereon, an annular platform in each holding room thereof, and a plurality of equidistantly spaced cavities on each platform while each rotary base has a slide  
15 plate fitted to a lower end thereof, and is passed into one of the holding rooms of the inner base; beads being positioned on the cavities for reducing friction against lower ends of the rotary shafts; each slide plate having a middle hole, and gaps adjacent to the middle hole thereof; protrusions being formed on the rotary bases, and fitted  
20 in respective gaps of the slide plates for connecting the slide plates to the rotary shafts.
7. The combination lock as claimed in claimed 1, wherein the second end of the push plate is formed with elongated holding protrusions for

the third springs to be passed around; other ends of the third springs being passed around connecting posts formed at a second end of the inner base.

8. The combination lock as claimed in claimed 1, wherein the main  
5 recover base has first and second end, and has positioning posts at the second end while the fourth springs are passed around the positioning posts; the inner base having recesses at second end thereof, onto which other ends of the fourth springs are passed.
9. The combination lock as claimed in claimed 1, wherein each rotary  
10 base has an engaging hole on a lower side while the each rotary control element has a polygonal engaging portion facing a corresponding engaging hole of the rotary bases on an upper side so that the rotary bases will be capable of rotating together with corresponding rotary control elements after the polygonal engaging  
15 portions are fitted into the engaging holes.
10. The combination lock as claimed in claimed 1, wherein each of the engaging trenches of the rotary locating shafts includes a flat side, and a curved side.
11. The combination lock as claimed in claimed 1, wherein the spring  
20 base is formed with a plurality of holding tunnels while the sixth springs provided for biasing the spring base up are held in position with the holding tunnels.
12. The combination lock as claimed in claimed 1, wherein one of the

sixth screws connecting the rotary locating shafts to the spring base has a tube portion projecting from a lower end thereof; the tube portion having screw threads on an inner side; a bolt being passed through an extending tube, and screwed into the tube portion; the  
5 extending tube being connected to the unlocking combination setting knob; the setting knob being connected to an outer base body arranged next to an outer side of the inward housing part; the outer base body being fixedly joined to an inner base body, which is arranged next to an inner side of the inward housing part, and which has sloping guide  
10 trenches on an annular side thereof; an adjustment rod being engaged with the sloping guide trenches at two ends of a pull pin thereof; the adjustment being joined to the extending tube so that the spring base can be moved by means of turning the unlocking combination setting knob.

15 13. A combination lock, comprising

an outer housing part secured to an outer side of a door; the outer housing part having a knob fitted thereto, which is provided for retreating a dead bolt to a disengaged position so that the door is unlocked; the outer housing part having a plurality numbered buttons  
20 fitted thereto, which have to be pressed respective numbers of times according to an unlocking combination to unlock the door; the knob being capable of actuating a rotary gear to push a push plate arranged in the outer housing part when the numbered buttons are pressed according

to the unlocking combination; and

being characterized by:

the outer housing part having a confirmation button fitted thereto; the confirmation button having an actuating rod, which will be engaged with  
5 an inner base to be detained in position after it is moved down by means of pressing the confirmation button; the actuating rod and the push plate having opposing slopes so that the push plate will slide when the actuating rod is moved down; the rotary gear and the push plate having opposing sloping portions so that the rotary gear will move up when the  
10 push plate slides; a fixing base being fixedly joined to the knob; the fixing base having an engaging hole on a lower side; the rotary gear having a polygonal engaging portion on an upper side thereof; the polygonal engaging portion being fitted into the engaging hole of the engaging hole of the fixing base so as to make the rotary gear capable of  
15 moving together with the fixing base when the rotary gear is moved up;

whereby the knob is only capable of turning in idle manner without causing the rotary gear to turn when the confirmation button is not pressed, failing to make the fixing base, which is fixed to the knob, engage the rotary gear; the rotary gear being moved up to engage the  
20 fixing base when the confirmation button is pressed, thus being capable of being turned for unlocking the door by means of turning the knob.

14. The combination lock as claimed in claimed 13, wherein the knob has a downwards projecting hollow post, which is formed with threads



on an inner side thereof, and an inner member is positioned within the knob, which has a middle hole, and a plurality of engaging protrusions around the middle hole while the fixing base has engaging holes on an edge of an upper end, a middle through hole, and a holding hole under  
5 and in communication with the middle through hole thereof; the threaded hollow post of the knob being passed into the middle through hole of the fixing base; a screw being passed through both the holding hole and the middle through hole of the fixing base, and screwed into the threaded hollow post; the engaging protrusions of the inner  
10 member being fitted in corresponding engaging holes of the fixing base.

15. The combination lock as claimed in claimed 13, wherein a push base is engaged with the rotary gear; the push base having two push posts formed nearer to an edge than a middle thereof for pushing the push  
15 plate with.

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